REMARKS

Applicant appreciates the Examiner's thorough consideration provided the present application. Claims 1, 7, 9, 11, 12, 15, 16, 23-25, 27-29, 36, 37, 40, 44, 45 and 47-49 are now present in the application. Claims 1, 11 and 29 have been amended. Claim 46 has been cancelled. Claims 1 and 29 are independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Objections

Claim 11 has been objected to due to the presence of minor informalities. In view of the foregoing amendments, in which the Examiner's helpful suggestions have been followed, it is respectfully submitted that this objection has been addressed. Reconsideration and withdrawal of this objection are respectfully requested.

Claim Rejections Under 35 U.S.C. §112

Claims 1, 7, 9, 11, 12, 15, 16, 23-25, 27, 28, 40, 44-46 and 48 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claim 46 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. These rejections are respectfully traversed.

In view of the foregoing amendments, it is respectfully submitted that these rejections have been addressed. Accordingly, all pending claims now comply with the written description

requirement and are definite and clear. Reconsideration and withdrawal of the rejections under 35 U.S.C. § 112, first and second paragraphs, are therefore respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 7-9 11, 12, 14, 27, 29, 36, 37, 40, 44 and 46-49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reber, U.S. Patent No. 6,110,748, in view of Gordon, U.S. Patent No. 5,892,577, and further in view of Virtanen, U.S. Patent No. 6,342,349. Claims 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reber in view of Gordon and Virtanen, and further in view of Dermers, WO 98/12599. Claims 23-25, 28, and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reber in view of Gordon and Virtanen, and further in view of Ekins, Clinical Chemistry, Vol. 37, no 11, pp. 1955-1967. These rejections are respectfully traversed.

Response to Examiner's Comments

The Examiner in the "Response to Arguments" section of the outstanding Office Action repeatedly stated "one cannot show nonobviousness by attacking reference individually where the rejections are based on combinations of references" to respond to Applicant's arguments. Applicant does not understand Examiner's rationales.

For example, Applicant in December 2 Amendment argued that Reber fails to teach that the scanning control means provides the position signals as recited in claims 1 and 29, and also fails to teach storing and retrieving the position signals provided by the scanning control means as recited in claims 1 and 29. Applicant further argued that it is unnecessary and of no use for

Reber to store or retrieve the position of the molecular receptors because the position of the molecular receptors is of no importance. Therefore, one skilled in the art would not have the motivation to modify Gordon's teaching of "look again" in view of Reber. In other words, Applicant did not simply attack the references individually, but argued the lack of motivation to combine the references.

Applicant in December 2 Amendment also argued that Gordon's re-scanning cannot place any microscope at the position of the detected object, but simply repeats the scanning to a selected area. Although Gordon's scanning may determine the presence of a particular material in a sample, it cannot be used to obtain the position of the material in the sample or to view the image of the material in the sample at all. In other words, like Reber, Gordon also fails to teach the scanning control means provides the position signals as recited in claims 1 and 29, and also fails to teach storing and retrieving the position signals provided by the scanning control means as recited in claims 1 and 29. Therefore, both Reber and Gordon fail to teach the same features as mentioned above. In addition, Virtanen is not relied on by the Examiner to teach the above features. If the Examiner takes the position that Virtanen discloses the above features to cure the deficiencies of the combination of Reber and Gordon, the Examiner has the initial burden to specify where and how Virtanen discloses the above features in order to establish a *prima facie* case of obviousness.

Applicant in December 2 Amendment also argued that both Gordon and Virtanen fail to teach "a microscope for viewing images of the marked objects", "the scanning control means using the retrieved position signals to place the microscope at the position of the marked objects to allow a user to view the images of the marked objects via the microscope" as recited in claim

1 and "placing a microscope at the position of the object using the retrieved the position signals" and "optically inspecting the object by viewing an image of the object via the microscope by a user" as recited in claim 29. In addition, Reber is not relied on by the Examiner to teach the above features. If the Examiner takes the position that Reber discloses the above features, the Examiner has the initial burden to specify where and how Reber discloses the above features in order to establish a *prima facie* case of obviousness.

In summary, Applicants' arguments in the previous Amendment dated December 2, 2005 did not merely attack references individually as alleged by the Examiner, but indeed argue the deficiencies of the combination of Reber, Gordon and Virtanen.

Claim Amendments & Arguments

In light of the foregoing amendments, Applicant respectfully submits that these rejections have been obviated and/or rendered moot. As the Examiner will note, independent claim 1 and 29 have been amended.

Claim 1 recites "scanning means for scanning the specimen in relation to the detector along a non-linear curve, wherein the scanning means comprises means for rotating the member and means for displacing the member along a radius of the rotation of the member, so as to identify the position of the marked objects and detect the property of the marked objects in the entire specimen, the means for rotating and the means for displacing being directly connected to the member, the member being rotatable and displaceable along a radius of the rotation of the member", "scanning control means for controlling the scanning means for scanning the specimen along the non-linear curve", "storage means for storing detector signals relating to the marked

objects provided by the detector and corresponding position signals provided by the scanning control means", "means for retrieving the position signals stored in the storage means", "a microscope for viewing or recording images of the marked objects, wherein the scanning control means using the retrieved position signals to place the microscope at the position of the marked objects to allow performing a detailed examination of the marked objects".

Claim 29 recites "detecting the light emitted from the object, thereby identifying the position of the object and detecting the property of the object during scanning of the specimen", "storing detector signals relating to the object provided by the detector and corresponding position signals provided by the scanning control means", "retrieving the position signals stored in the storage means", "placing a microscope at the position of the object using the retrieved the position signals to allow performing a detailed examination of the object" and "optically inspecting the object by viewing an image of the object via the microscope by a user".

Support for the amendments to claims 1 and 29 can be found on the paragraph beginning on page 14, lines 25-30 of the specification, the Title, the Field of the Invention, and the Summary of the Invention. Applicant respectfully submits that the above combinations of elements and steps as set forth in amended independent claim 1 and 29 are not disclosed nor suggested by the references relied on by the Examiner.

The present invention relates to a detection of marked objects in a sample, wherein said sample is arranged on the member positioned on the frame. As described in the introductory part of the patent application, the invention relates to a method and an apparatus that provide rapid scanning of large specimens to detect and determine positions of objects having specific characteristics and being randomly positioned on the member. Thus, the present invention

provides means for, in a sample, detecting marked objects without knowing the position of the marked objects present, if any present at all.

The sample is arranged on a member, and by moving, *i.e.,* rotating and translating, the member in relation to a detector it is possible to scan the member and thereby detect if any marked objects are present. Furthermore, by arranging scanning control means for controlling the scanning means in a manner so that the scanning control means store position signals for each marked object detected, it is possible at a later stage to retrieve the combined information of position signals and detected marked objects and thereby place a microscope at the position of the detected marked objects to inspect the marked objects further.

Thus, according to the present invention, it is possible to detect the position of an object without having any prior information of the position of said object, since the scanning control means store the position signals when a marked object is detected.

When a marked object is detected, then two features are stored:

- detector signals relating to the marked object (see page 8, line 27 to page 9, line 2.)

- position signals relating to the position provided by the scanning control means.

As discussed on page 9, lines 4-9, the specification discloses "...a corresponding coherent data set may be stored in the storage means, and each of the coherent data sets may be seen as representing a unique signal "event".

Thus, the position signals are provided by the scanning control means, and the detector signals are provided by the detector. This is in contrast to a system, as discussed below, wherein address or identification information is provided on the disc detected by the detector.

The prior art documents relied upon by the Examiner relate to a completely different principle in that they all relate to detection of events taking place at predetermined positions, wherein the only task is to step from one known position to the next known position in order to detect whether an event has taken place at said known position, a principle called Lab-on-a disc.

In Reber this is exemplified by the fact that molecular species are arranged in a pattern across the medium, and that for each molecular species identification information, i.e., machine-readable data, is positioned adjacent the molecular species in the medium (see for example Figures 2-4.) Reber does not scan a medium to search for marked objects. Instead Reber positions a data reader at the position of machine-readable data and the detector then senses whether a binding event has taken place at the position of said machine-readable data. The information stored is described col. 5, lines 10-12: "The processor 36 ran receive signals associated with machine-readable data from the data reader 34 and signals associated with binding data from the detector 36".

The Examiner referred to Reber's processor 36 as the scanning control means and referred to Reber's detector 38 as the detector of the present invention. However, the processor 36 of Reber simply obtains the information provided by the detector 38 to control the positioning mechanism. Thus, Reber fails to teach that the processor 36 provides any position signals of the molecular receptors 22 and 24 receiving the corresponding molecule structures. Therefore, Reber fails to teach that the scanning control means provides the position signals as recited in claims 1 and 29.

In fact, Reber teaches the opposite, namely that the identification of a molecular species is found as information on the CD, i.e., the medium. Therefore, the information of the position of

any object is not provided by any scanning control means, but is merely given by detecting (using the detector) the information located on the medium holding the specimen.

Reber also fails to teach storing and retrieving the position signals provided by the scanning control means as recited in claims 1 and 29. In fact it is unnecessary for Reber to store or retrieve the position of the molecular receptors because the position of the molecular receptors is of not importance in Reber. Reber discloses that the machine-readable data 26 and 28 associated with the molecular receptors 22 and 24 so that the data reader 34 can read the machine-readable data 26 and 28 to identify the molecular receptors 22 and 24 (see col. 3, lines 8-16). Accordingly, the purpose of Reber, i.e., whether the binding event can be correlated to one molecular receptor or the other, is fulfilled by reading the machine-readable data on the medium associated with each molecular receptor.

The Examiner states, when commenting our last reply, "it is important to recognize that collecting data in a random access manner inherently implies that the site positions are known by processor 36 in order to selectively position the variety of devices (e.g. 34, 38 and 40) at the desired site for data collection". Again the Examiner relies on information that allegedly is found inherent in Reber; however, there is no hint in Reber that this is correct.

Collecting in a random manner does not inherently require information of the position of a particular event, since position information is not the information that allows random collection. Instead, information of the performed movement of, for example, the data reader that is brought from one event to the next is provided to the next component to be moved, if they are not moved in common. For example, information could be the length and direction of the movement of the data reader from one event to the next, whereby the processor is capable of

directing the next component to move in the same manner. Such information is completely different from information of position of a marked object on the medium.

Thus, Reber does not store or retrieve position information provided by the scanner control means, and furthermore, there is no motivation in Reber to do so, since Reber functions by reading information on the medium, instead of receiving position information from the scanning control means.

Gordon is another example of Lab-on-a-disc which is exemplified by the wells disposed in the disc. FIG. 7 of Gordon shows a flow diagram of the process. It is clear from the diagram that a scanning is performed by moving from one well to the next, and that position of the well is taken by reading address information in the medium, "take readings from well position". Thus, any address information provided in Gordon is provided by reading the address information positioned in the medium in relation to the well. Furthermore, the position of the wells are predetermined and cannot be compared to the random position of marked objects in a specimen spread over a member.

However, the Examiner alleged that Gordon discloses that "the detected object positions stored in a storage means are retrieved and used by a scanning means to position a means for optical inspection of detected object" and "and how to precisely determine the angular position and the radial position".

First of all it is important to note, that Gordon does not disclose "the detected object positions stored in a storage means are retrieved and used by a scanning means to position a means for optical inspection of detected object" as the Examiner alleged. In the passages referred to by the Examiner, Gordon simply discloses "it may be desirable to scan a selected area

of the disc surface ....when it is desired to look again at a specific region of interest. In other words, Gordon merely discloses re-scanning a specific region of interest. There is no disclosure in Gordon describing that a scanning or re-scanning is controlled by retrieving position information, wherein said position information is provided by the scanning control means.

In fact, Gordon discloses the opposite, namely that digital address information is encoded onto the disc (col. 7, lines 5556). Thus, address information is positioned on the disc, and not provided by the scanning control means.

Furthermore, scanning a "region of interest" is different from performing a detailed examination of a "detected object", since each region may comprise a variety of objects. Thus, rescanning a region of interest is different from placing a microscope at the position of the marked object as recited in claim 1 and 29.

One difference is that rescanning is performed using scanning means and not a microscope. Another difference is that the term "scanning" implies that no accuracy is present. One does not scan when one looks specifically at one specific object. It is correct that Gordon teaches obtaining an image of the entire disc surface or a portion thereof. However, Gordon does not teach obtaining a view of a single detected marked object on the disc surface.

Second, it is important to note that Gordon does not disclose "object positions stored in a storage means are retrieved and used by a scanning means to position a means for optical inspection of detected object." Thus, there is neither explicit nor implicit disclosure of "the detected object positions stored in a storage means are retrieved and used by a scanning means to position a means for optical inspection of detected object", wherein said position information is provided by the scanning control means.

The Examiner refers to col. 9, lines 28-33 of Gordon, where discloses "[r]ather than scan the whole surface of the disc, the personal computer may bra arranged to step the light source/detector arrangement over the disc surface from one well to another. This is enabled by the precise position information obtained from the calibration marking and the disc edge." This citation clearly shows that, when read together with the two former passages, calibration is conducted using information located in the disc, not provided by the scanning control means.

Thus, when combining Reber and Gordon, the Examiner disregards the information in Reber, i.e., that the information of molecular species is located on the medium holding the specimen as well as the information in Gordon, i.e., that address information is encoded on the disc. Furthermore, the Examiner reads into Gordon that Gordon stores object positions in a storage means and retrieve such object positions for positioning a means for optical inspection of detected objects, which is in fact neither explicitly nor implicitly disclosed in Gordon.

When combining Reber and Gordon, the Examiner removes the feature that both references present, namely that identification or address information is located on the disc, in order to reach the feature that position signals are provided by the scanning control means. Since none of the references discloses storing or retrieving position information provided by the scanning control means, then the combination of the two references does not get closer to the present invention than each reference taken alone. Therefore, the obviousness rejection using a combination of Reber and Gordon is improper.

Virtanen is a third example of Lab-on-a-disc, and again the system and method of Virtanen does not disclose that marked objects randomly located on the member may be

identified. The system and method of Virtanen have predetermined positions of the cell-type specific recognition element, wherein possible events may be detected.

The Examiner states that Virtanen teaches that, with proper software, optical disc readers are scanning confocal microscopes which allow the study and identification of the detailed structure of biological and other specimens, and states that the optical disk reader of Virtanen is used to "view the image of the cells stained by e.g. signal responsive moieties (i.e., the cells are made viewable by stains such as signal responsive moieties.

In this regard the Examiner ignored the difference between viewing the staining and viewing a cell. When viewing a stained cell, the only information given relates to the parts of the cell being stained. If the nucleus of a cell is stained, then the remaining part of the cell is not viewed by the optical disc reader of Virtanen. If surface portions of the cell are stained, then the inside of the cell cannot be viewed by the optical disc reader of Virtanen. Thus, the optical disk reader of Virtanen cannot perform an optical inspection of identified marked objects, since the only information obtained by the optical disk reader is information about staining.

It is important to note that Virtanen clearly knows the limitation of his system, since he uses the term "detailed structure of specimens", not "detailed structure of objects in the specimens". Virtanen explains what is meant by detailed structure of specimens, namely number of cells in the specimen or cell shape measurement. Thus, Virtanen does not disclose that optical disk readers can be used as a microscope to identify a cell by looking at it through a microscope, but merely disclose that by use of optical disk readers details about a specimen can be obtained, as they can be using a microscope.

When continuing reading Virtanen, it appears from column 50, line 27 to show what Virtanen means with the term "scanning confocal laser microscope". Virtanen discloses that CD- or DVD drives has a confocal nature, i.e., the use of CD- or DVD drives in the technique of Virtanen allows detection through a certain depth of the specimen, unlike systems that are not of confocal nature.

In relation to FIGs. 33A to 33C of Virtanen, it is described that a plurality of first cell type-specific recognition elements are disposed on the substrate surface capable of binding a cell, and in FIG. 33C that signal responsive moieties are added, decorating the surface of the bound cell, rendering it suitable for detection. It is further emphasized in Virtanen that in the embodiment shown in FIG. 33 spacers are not cleavable. From the description in relation to FIG. 33, it is clear that detection of the cell is conducted by detecting signal moieties to the surface of the cell. Accordingly, the system in Virtanen does not allow any identification of details of the cell beyond the mere fact that the cell is present and to a certain extent the size of the cell, insofar as the signal moieties cover the whole surface of the bound cells. Therefore, Virtanen does not disclose a microscope for a detailed examination of a detected object, when the term "a detailed examination" is interpreted in the context of the present invention.

When rejecting a claim for being obvious in view of a combination of references, the combination must in fact disclose all the features of the claims being rejected. However, the combination of the references does not lead to all the features of the claims, such as provision of position information from the scanning control means, and positioning of a conventional microscope on the position of a detected object. Therefore, the Examiner, starting from the combination of three references, further extrapolates by stating that for the skilled person it

would be obvious to provide a conventional microscope. Therefore, the obviousness rejection is improper.

The three references Reber, Virtanen and Gordon are all trying to solve a problem, where certain elements for a predetermined analysis are located at fixed (known) locations, while the present invention is solving a completely different problem. The present problem is to determine the location of an element, which might or might not be present on the medium. If present, the location is random and the invention describes how to detect it, first based on the detected signal, later on the visual inspection by the microscope, if such an event is present and where on the disc, it is located. None of the cited references will be able to solve the problem with randomly positioned events.

With regard to the Examiner's reliance on Dermers and Ekin, these references have only been relied on for their teachings related to the dependent claims of the present invention. These references also fail to disclose the above combination of the elements and steps as set forth in amended independent claims 1 and 29. Accordingly, these references fail to cure the deficiencies of Reber, Gordon or Virtanen.

Accordingly, none of those references individually or in combination teach or suggest the limitations of amended independent claims 1 and 29. Therefore, Applicant respectfully submits that claims 1 and 29 and their dependent claims clearly define over the teachings of the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant respectfully petitions for a two (2) month extension of time for filing a response in connection with the present application and the required fee is attached herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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